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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,621	03/29/2004	Chien-Hsueh Shih	67,200-1168	2719

7590 01/23/2006

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EXAMINER

WONG, EDNA

ART UNIT PAPER NUMBER

1753

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/811,621

Applicant(s)

SHIH ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

***Specification***

The disclosure is objected to because of the following informalities:

page 12, line 10, the word "alkyphenol" should be amended to the word --  
alkylphenol --.

page 12, line 12, the word "alkyphenol" should be amended to the word --  
alkylphenol --.

page 15, line 1, "S1" should be amended to -- 51 --.

page 15, line 7, "S2" should be amended to -- 52 --.

page 15, line 9, "S3" should be amended to -- 53 --.

page 15, line 15, "S4" should be amended to -- 54 --.

page 16, line 5, "S5" should be amended to -- 55 --.

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to

determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Objections***

Claims 3, 8, 11, 15 and 18 are objected to because of the following informalities:

Claim 3

line 2, the word "alkyphenol" should be amended to the word -- alkylphenol --.

Claim 8

line 3, the word "alkyphenol" should be amended to the word -- alkylphenol --.

Claim 11

line 2, the word "alkyphenol" should be amended to the word -- alkylphenol --.

Claim 15

line 2, the word "alkyphenol" should be amended to the word -- alkylphenol --.

Claim 18

line 3, the word "alkyphenol" should be amended to the word -- alkylphenol --.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

Claims **7-8 and 19** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7

lines 3, "said ionic polymer" lacks antecedent basis.

Claim 19

lines 3, "said ionic polymer" lacks antecedent basis.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

I. Claims **1 and 2** are rejected under 35 U.S.C. 102(a) as being anticipated by **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1).

Miura teaches an electrolyte for copper electroplating, comprising:

(a) an electrolyte solution (= an electrolytic copper plating solution) [page 2,

[0019]]; and

(b) a composition comprising an organic acid (= a complexing agent = an oxycarboxylic acid = citric acid) [page 2, [0023] and [0027]] and a non-ionic polymer (= a nonionic surfactant) [page 3, [0043]] mixed with said organic acid provided in said electrolyte solution.

The organic acid is citric acid (page 2, [0027]) or acetic acid.

With further regards to “a composition ...”, if the composition is physically the same, it must have the same properties (MPEP § 2112.01(II)).

Since Miura teaches all of the limitations recited in the instant claims, the reference is deemed to be anticipatory.

**II.** Claims **9 and 10** are rejected under 35 U.S.C. 102(a) as being anticipated by **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1).

Miura teaches an electrolyte for copper electroplating, comprising:

(a) an electrolyte solution (= an electrolytic copper plating solution) [page 2, [0019]]; and

(b) a composition comprising an organic acid (= a complexing agent = an oxycarboxylic acid = citric acid) [page 2, [0023] and [0027]] and a non-ionic polymer (= a nonionic surfactant) [page 3, [0043]] mixed with said organic acid provided in a suspension layer in said electrolyte solution

The organic acid is citric acid (page 2, [0027]) or acetic acid.

With further regards to “a composition ...”, if the composition is physically the same, it must have the same properties (MPEP § 2112.01(II)).

With further regards to “provided in a suspension layer in said electrolyte solution”, this is a process limitation and fails to distinguish the composition from the prior art.

Since Miura teaches all of the limitations recited in the instant claims, the reference is deemed to be anticipatory.

**III.** Claims **17 and 20** are rejected under 35 U.S.C. 102(a) as being anticipated by **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1).

Miura teaches a method for electroplating a metal onto a surface in an electroplating electrolyte solution, comprising the steps of:

(a) providing a composition mixture comprising an organic acid (= a complexing agent = an oxycarboxylic acid = citric acid) [page 2, [0023] and [0027]] and a non-ionic polymer (= a nonionic surfactant) [page 3, [0043]];

(b) forming a suspension layer of said composition mixture in said solution (*inherent*);

(b) forming a wetting layer on said surface by passing said surface through said suspension layer and into said solution (= small pieces of a silicon wafer with a

deposited seed layer were immersed in the plating solutions) [page 5, [0074]]; and

(c) electroplating said metal onto said surface (page 4, [0053]).

The organic acid is citric acid (page 2, [0027]) or acetic acid.

The method further comprises a substrate (= a silicon wafer) and wherein said surface comprises a metal seed layer deposited on said substrate (page 4, [0050]).

With further regards to “a composition ...”, and “forming a suspension layer of said composition mixture in said solution”, if the composition is physically the same, it must have the same properties (MPEP § 2112.01(II)).

Since Miura teaches all of the limitations recited in the instant claims, the reference is deemed to be anticipatory.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims **3-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1) as applied to claims 1 and 2 above, and further in view of **Willis** (US Patent No. 4,347,108).

Miura is as applied above and incorporated herein.

The method of Miura differs from the instant invention because Miura does not disclose the following:

- a.     Wherein said non-ionic polymer is an alcohol, an amine or alkylphenol alkoxylate, as recited in claim 3.
- b.     Wherein said non-ionic polymer is an alcohol, an amine or alkylphenol alkoxylate, as recited in claim 8.

Like Miura, Willis teaches an electrolyte for copper electroplating. Miura teaches that amines, alkanol amines, amides and polyglycol-type wetting agents are known in the art (col. 5, line 45 to col. 8, line 46).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the nonionic surfactant described by Miura with wherein said non-ionic polymer is an alcohol, an amine or alkylphenol alkoxylate because Miura teaches that the any known material that has been conventionally used in copper plating can be used as the wetting agent (page 3, [0043]) and amines have been conventionally used in copper plating as taught by Willis (page 3, [0043]).

- c.     Wherein said composition is present in said electrolyte solution in a concentration of about 5% by weight, as recited in claim 4.

The invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Miura with wherein said composition is present in said electrolyte solution in a

concentration of about 5% by weight because it has been held that changes in temperature, concentration or both, is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller*, 220 F2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and MPEP § 2144.05.

d.       Wherein said non-ionic polymer has a molecular weight of less than 1,000, as recited in claim 5.

Willis teaches that, for example, Carbowax No. 1000 has a molecular weight ranging from about 950 to 1,050 (col. 6, lines 32-34).

e.       Wherein said organic acid is present in said composition in a wt. % of about 10, and said ionic polymer is present in said composition in a wt. % of about 5, as recited in claim 7.

Miura teaches that the complexing agent is used in the concentration range of, for example, 0.05 to 2.0 mol/L (page 3, [0039]).

Willis teaches that the amount of the wetting agent which is incorporated into the acid copper plating baths and concentrates will depend upon the types and amounts of other ingredients in the compositions, but generally from about 0.1 to about 5 g/l (col. 8, lines 40-46).

The invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrolyte described by Miura with wherein said organic acid is present in said composition in a wt. % of about 10, and said ionic polymer is present in said composition in a wt. % of about 5 because it has been held that changes in temperature, concentration or both, is not a patentable modification; however, such changes may impart patentability to a process if the ranges claimed produce new and unexpected results which are different in kind and not merely in degree from results of the prior art, such ranges are termed "critical" ranges and Applicant has the burden of proving such criticality; even though Applicant's modification results in great improvement and utility over the prior art, it may still not be patentable if the modification was within capabilities of one skilled in the art; more particularly, where general conditions of the claim are disclosed in the prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. *In re Aller*, 220 F2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) and MPEP § 2144.05.

II. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1) as applied to

claims 9 and 10 above, and further in view of **Willis** (US Patent No. 4,347,108).

Miura and Willis are as applied for reasons discussed above and incorporated herein.

**III.** Claims **18 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Miura et al.** (US Patent Application Publication No. 2003/0155247 A1) as applied to claims 17 and 20 above, and further in view of **Willis** (US Patent No. 4,347,108).

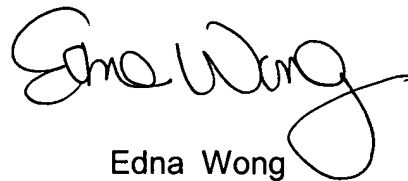
Miura and Willis are as applied for reasons discussed above and incorporated herein.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Edna Wong". The signature is fluid and cursive, with a large loop at the end of the last name.

Edna Wong  
Primary Examiner  
Art Unit 1753

EW  
January 18, 2006